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Applications Engineering

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California Energy Commission
Mr. Bill Pennington
BPenning@energy.state.ca.us.

Re: Development of Title 24 2005 Standard

Dear Mr. Pennington :

Only in February of 2003 has a draft of the possible changes to Title 24 for 2005 come to my attention. While many of the new requirements make sense there are some that should change. I list those in the table below.

Section	Requirement	Suggestion	Reason
144.b.4 – Outdoor Design Conditions	Design conditions set by CEC	Add an exception if the design engineer has a critical application where the conditions must be met at all times.	One example is a critical process, such as animal research or biological work, where the space requirements are absolutely critical.
144.c.2.B Power consumption of VAV fans	10 hp fans must have VFD (or similar)	Increase to 20 hp	Variable air volume systems already compete with constant volume systems and are generally more expensive – especially in this size range (rooftop equipment). The additional requirement of a VFD on a 10 hp fan may actually create more of a competitive edge for constant volume systems and lead to their selection due to budgetary reasons.
144.c.4	ECM motors on series fan-powered	Change to *"…units 1/3 to 1 hp"*	The cost of an ECM is about the same for motor sized 1/8 to 1 hp, however, because of the much smaller fan hp of the 1/8 hp motor,

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	boxes		the payback is 1/8th of that for a 1 hp motor. The payback for 1/3 hp is ok, also General Electric (the major provider of ECM's) only makes them down to 1/3 hp.
Not in standard	Fan Pressure optimization for DDC/VAV systems	Add	Set point reset (fan pressure optimization) is required by ASHRAE 90.1-1999 (and 2001) for DDC VAV systems. The cost is minimal and the savings are significant if DDC is already installed
144.h.3 – Tower Flow Turndown	Requirement for all cells to be run at part load condition	Put a limit on the number of cells that must be designed in this manner.	Very few cooling towers allow flow rates less than 30-40% -- even when designed for variable flow. If we have four cells in an application and dedicated condenser water pumps, each cell will only have 25% flow. While part "B" seems to indicate that the cell could be designed for 33% minimum flow, the actual requirement states that "all cells can be run in parallel"
144.i – Limitation of air-cooled chillers	Systems over 300 tons can have maximum 100 tons air-cooled chillers	Delete	• This requirement seems to restrict trade • Restricting to a maximum 100-ton air-cooled chiller essentially eliminates any air-cooled chillers above 100 tons from being sold. Without manufacturing plants being able to produce and sell larger chillers, the cost of air-cooled chillers 100 tons and smaller will rise and become much less economical. • There are many applications where air-cooled chillers make economic sense for building owners. For example, schools that do not have maintenance staff to maintain cooling towers.

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			• Air cooled chillers with helical-rotary (screw) compressors receive extensive relief as ambient temperature (dry bulb) drops. Dry bulb drops much more quickly than wet bulb – especially in your climates. So systems that operate nights, non-summer hours (September, October, etc.) etc. get extensive energy reduction from that drop in temperature. • Economics and energy should be used by the design engineer on the specific application, not mandated by code.
144.j.2 – Chiller isolation		Adjust the laste sentence to read: *"Chillers that are piped in series shall be considered as one chiller."*	There are many reasons chillers may be piped in series: • Increased temperature differential • To take advantage of an alternate fuel type (or heat recovered from e.g. a turbine) • To enhance the chiller's capability to be loaded to recover heat from its condenser. So having the *phrase "for the purpose of increased temperature differential"* is too limiting.

Regards,

Mick Schwedler, PE
Senior Principle Applications Engineer